



A look at the art of die-less duplicating...





## **DIE-LESS DUPLICATING . . . a technique of nature**

Leaves on a tree represent one of the most basic forms of exact duplication. Unlike snow where each flake is different, Mother Nature makes each leaf on a branch identical in size and shape.

### **TABLE OF CONTENTS**

|                                                                          |            |                                                                              |            |
|--------------------------------------------------------------------------|------------|------------------------------------------------------------------------------|------------|
| Die-less Duplicating, a Technique<br>for Industry . . . . .              | Page 3     | Di-Acro Brake Models . . . . .                                               | Page 28-29 |
| The Di-less Duplicating Concept . . . . .                                | Page 4     | The Die-less Duplicating Concept<br>with Di-Acro Rod Parters . . . . .       | Page 30-32 |
| Die-less Duplicating at Work . . . . .                                   | Page 5 -7  | Di-Acro Rod Parter Models . . . . .                                          | Page 33    |
| The Die-less Duplicating Concept<br>with Di-Acro Shears . . . . .        | Page 8 -11 | The Die-less Duplicating Concept<br>with Di-Acro Benders . . . . .           | Page 34-37 |
| Di-Acro Shear Models . . . . .                                           | Page 12-13 | Di-Acro Bender Models . . . . .                                              | Page 38-39 |
| The Die-less Duplicating Concept<br>with Di-Acro Notchers . . . . .      | Page 14-16 | The Die-less Duplicating Concept<br>with Di-Acro Rollers . . . . .           | Page 40-42 |
| Di-Acro Notcher Models . . . . .                                         | Page 17    | Di-Acro Roller Models . . . . .                                              | Page 43    |
| The Die-less Duplicating Concept<br>with Di-Acro Punch Presses . . . . . | Page 18-21 | The Die-less Duplicating Concept<br>with the Di-Acro Spring Winder . . . . . | Page 44-46 |
| Di-Acro Punch Press Models . . . . .                                     | Page 22-23 | Di-Acro Spring Winder Model . . . . .                                        | Page 47    |
| The Die-less Duplicating Concept<br>with Di-Acro Brakes . . . . .        | Page 24-27 | More Di-Acro Machines . . . . .                                              | Page 48    |

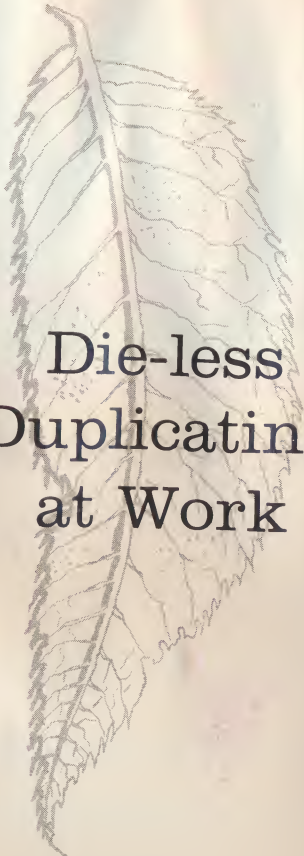


## DIE-LESS DUPLICATING...a technique for industry

The use of metal through the years has expanded rapidly. New types and applications have constantly been added and metal today has progressed to a vehicle of inherent beauty, strength and pliability, and is available in almost every shape and size imaginable. When being formed and processed into products or component parts, metal is usually thought of in terms of large production lines, rows of machinery and a stockpile of inventory. Oftentimes the opposite is true and only a small production run or the making of models and prototypes is needed. These usually are uneconomically fabricated by hand, by tying up large and costly production equipment or by some other slow and equally inefficient method. A solution to this problem is outlined in the following pages of this booklet a "Look at the Art of Die-less Duplicating." Die-less Duplicating, perfected by Di-Acro, has been used successfully for years by manufacturers in all types of industry in their experimental labs, model shops and production lines to fabricate parts and components in a variety of shapes and sizes.

Although Die-less Duplicating is usually associated with the smaller hand operated Di-Acro Precision Machines – the Di-Acro Shear, Notcher, Punch Press, Brake, Rod Parter, Bender, Roller and Spring Winder – many manufacturers have found this system highly efficient with power operated Di-Acro Machines too. Type and size of material and quantity will in most cases dictate whether hand or power Di-Acro Machines are to be used. However, consideration should be given to the use of one or more of the hand operated Di-Acro models to relieve large cumbersome power machines of small or short run jobs. In many cases they will pay for themselves on the first job alone. In addition to their low original cost, Di-Acro Die-less Duplicating Machines offer an additional advantage in that they can be used over and over again for many different jobs . . . not just one. They require little or no experience to operate – even by women – and can be easily moved from one department to another.





## Die-less Duplicating at Work

Di-Acro Die-less Duplicating Machines perform a wide variety of jobs for a leading manufacturer of measuring equipment. "For over ten years, we have used Di-Acro Equipment in our press room area for anything that can be sheared, pierced or formed," says Brush Instruments, Division of Clevite Corporation, of Cleveland, Ohio. ■ At Brush Instruments a Di-Acro No. 1 Punch Press, Notcher and No. 24 Box Finger Brake are used in prototype and short run production. A wide range of materials are formed, including aluminum, mild steel, brass, phosphorous bronze and stainless steel. Tolerances on all the work are held to within plus or minus .005". ■ Brush Instruments manufactures equipment used for measuring all types of electrical or mechanical phenomenon such as stress, strain, torque or torsion. At top right, Brush Instrument personnel examine a Brush Recorder produced with the help of Di-Acro Equipment. ■ Di-Acro Machines have proven their versatility many times over at Brush Instruments. "Our Di-Acro Equipment is extremely valuable when we get crash programs. It saves tooling time and expense. Often when a production machine breaks down, we set up the Di-Acro Machines in a hurry to complete the job. These machines are also used to supplement our power fabricating equipment and also save setting up a larger machine." At the lower right, radiation shields are being punched on a Di-Acro Punch Press. A Di-Acro Notcher and Box Finger Brake are mounted on the bench.

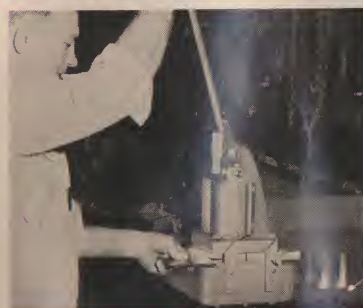




A Di-Acro Hand Shear, in operation for over fifteen years, sizes the blank for a shield to be used on Addressograph Machines.



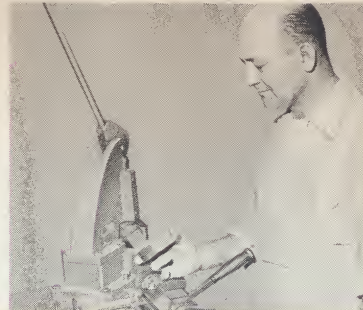
Di-Acro Notcher cuts two notches in sized blank. Notches must be burr free and accurately positioned.



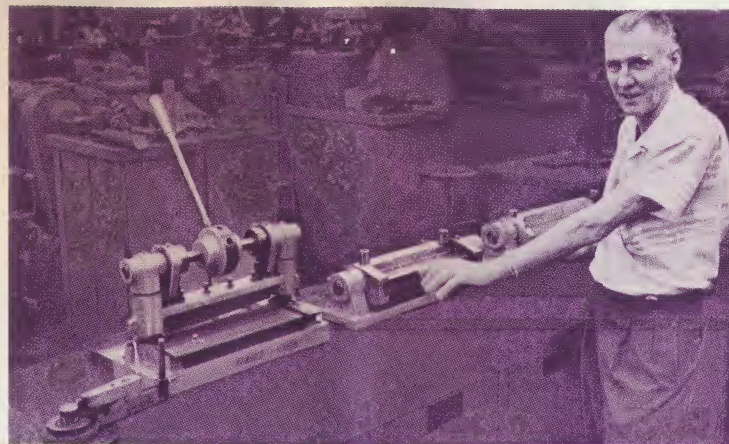
Di-Acro Brake forms sized and notched blank, holding tolerances to plus or minus .005".



Finished part has been duplicated to "die-accuracy" without the use of dies. The same accuracy can be held for succeeding parts.



Die-less Duplicating Machines have paid for themselves many times over at Addressograph-Multigraph Corporation of Cleveland, Ohio. The special parts department at A-M employs a Di-Acro Shear, Notcher, Brake, Bender and Box Finger Brake for short run specialized production. ■ "These machines are in use every week," said an A-M spokesman. "The machines are used for the fabrication of special parts and for short run production. Tolerances from plus or minus  $\frac{1}{4}$ " to plus or minus .005" are held, depending upon the operation." ■ In the Addressograph-Multigraph model shop, a Di-Acro Bender, Shear, and two Brakes are used. Here is where Di-Acro Equipment really meets the test of versatility. "For building of prototypes and for experimental work, Di-Acro Equipment is a must . . . it's easy to set up, reset, breakdown and accuracy is good," says A-M. ■ Over the years they have used Di-Acro Equipment, A-M has experienced very little service or repair on any of the machines, although they are in constant use. A Hand Shear purchased over 15 years ago has required only periodic lubrication and occasional blade sharpening. ■ Addressograph-Multigraph gives a typical example of production savings with Di-Acro Die-less Duplicating. "Setting up a mill or saw to do a cutting job takes considerably more time than to shear the same part on a Di-Acro Shear. We save setup time and get better results."



**Class 1250 Multigraph Multilith Offset Duplicator with Automated Features.**





Die-less Duplicating plays a vital role in many sheet metal shops boasting a high degree of sophistication. Collins Radio Company of Cedar Rapids, Iowa uses over twenty hand operated forming machines to complement two tape-controlled punch presses and dozens of hydraulic presses ranging to 250 tons capacity. Small complex parts are produced on a regular production basis on Di-Acro Benders, Brakes, Notchers and Shears. Because of the size and intricacy of most of these parts, other methods of production are out of the question. Skilled operators have a wide range of tooling at their disposal and are responsible for their own setup. Parts samples are used to aid setups for repeat runs and insure "die-accurate" duplication ■ Collins Radio manufactures communications equipment precision engineered and assembled to fine tolerances. The need for accurate duplication of vital parts makes Di-Acro Die-less Duplicating Equipment indispensable for forming intricate precision components. Many parts are so small they could not be produced on larger equipment as shown in the photo, top left. ■ Collins Radio uses Die-less Duplicating Equipment in a true production operation. Standards are set, operation charts are written and tooling allowances are made for parts to be fabricated. It amounts to having a completely self-sufficient job shop right on the production line. ■ Time is often a determining factor in small parts production at Collins. Here again Die-less Duplicating shows itself to be invaluable. Rapid tooling changes insure that rushed production schedules will be met at lower cost than by other methods.





Many intricate business machine parts are formed economically on Di-Acro Die-less Duplicating Equipment at National Cash Register Company.

■ On regular production runs, NCR has been using a No. 1A and No. 3 Di-Acro Bender on an average of forty hours per week for many years. Due to their ease of setup and all around versatility, the same machines serve double duty when used for maintenance on other machines, tools, and plant fixtures. ■ Parts, such as the bill weight wires shown in the top photo are formed in large quantities. Other small parts too numerous to be economically stocked are produced in small lots to exacting tolerances. Fast setup means that all parts can be "stock" items, produced rapidly as needed by Die-less Duplicating. ■ Together with Di-Acro Benders, NCR uses Di-Acro Brakes, as shown at right, for precision forming of small parts. The Brakes provide versatility needed when forming the wide variety of parts used by NCR.



Increased accuracy coupled with cost and time savings are some of the benefits of Die-less Duplicating realized by P. R. Mallory and Company, Indianapolis. ■ A Di-Acro Shear, Punch and Brake with open end finger are used daily for experimental work and developing new electrical switches. Both metals and plastics are worked to plus or minus .005".

Anton Labs of Brooklyn, New York forms a wide variety of metals to  $\frac{1}{16}$ " thick with controlled precision on Di-Acro Die-less Duplicating Equipment. ■ Making parts for prototype electronic equipment demands precision, the kind delivered by all Di-Acro Equipment. Like many other firms, Anton uses their Di-Acro Machines for maintenance work too.

# The Die-less Duplicating Concept

WITH DI-ACRO  
SHEARS



Although shearing of sheet material is a common procedure in almost every plant working with metal, never had special equipment been offered for small piece shearing until the advent of Di-Acro. Now a Shear is available having a maximum width of 6 inches that will shear both thin and heavy sheet material on a production basis with precision accuracy. The same speed and accuracy is found in the larger Di-Acro Models with shearing capacities to 36 inches.

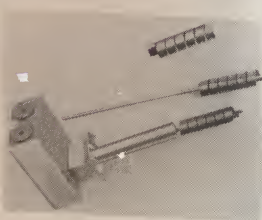
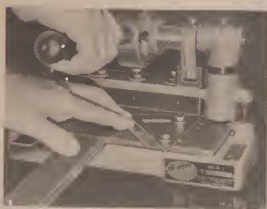




Swedish steel doctor blades for roto-gravure presses are sheared to plus or minus .002" squareness over their 15 inch length by a Di-Acro hand operated Shear. Oliver Machinery Company, Grand Rapids, Michigan has equipped their Shear with a special jig for the specialized operation. The doctor blades, used to wipe excess ink from roto cylinders, are made from .003" to .005" spring steel. Clean, burr-free cuts are a must in this operation, formerly done by a hand fitting and "grinding in" method.

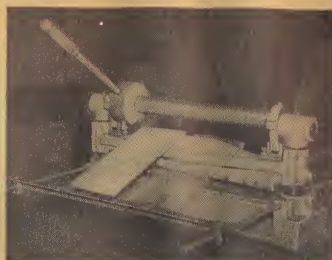
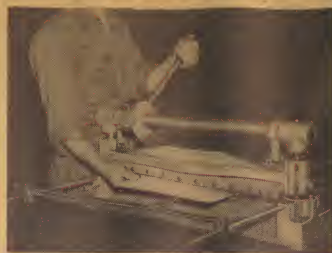
Cutting bi-metals to extreme accuracy without distortion is the job Metals and Controls Corporation of Attleboro, Mass., assigned to their No. 1 Di-Acro Shear.

Use of a Di-Acro Shear instead of hand shearing has resulted in fewer rejects for this company. Many different angles are cut by using the Shear's protractor gauge.





Cutting material to size from coil stock is done with a hand operated Di-Acro Shear by Columbia Metal Products, Inc. of Columbia, Tennessee. Aluminum sheets and Alclad wire cloth are cut to  $6\frac{1}{2}$ " x  $15\frac{1}{2}$ " dimensions from coil stock on a 24" Di-Acro Shear. ■ Material being worked is .025" aluminum used in the manufacture of vents for building foundations. Cutting speed of the Di-Acro hand Shear rivals that of power shears, making it ideal for cutting sheets to size from sheet or roll stock. ■ A clean, burr-free cut insures that the sheet will be ready to work without extra filing or deburring. Micrometer operated back gauges are standard equipment on all Di-Acro overdriven Shears. This back gauge allows rapid setup and close repeat accuracy for short or long run operations. ■ As shown at top right, the handle of the Shear can be moved to the side to allow more convenient feeding of strip or roll stock. The Shears ease of operation insures that production speeds can be maintained on short or long runs.



Thin gauge stainless steel is accurately sheared by Solar Aircraft Company, San Diego, California, on a hand operated 24" Di-Acro Shear. .001" to .020" gauge foil used in sub-assembly fabrication for high temperature brazed assemblies is sheared with minimum distortion. ■ Accuracy and fast setup are important at Solar when assembling experimental thin gauge components. The Di-Acro Shear meets these requirements and more, providing ease of operation and low maintenance as well. A clean, sharp cut is always assured with Di-Acro Shear blades equipped with four cutting edges. Adjustable blade rake lets the operator select the right angle for the material being worked.



Precision and low cost is a combination that has sold Duralith Corporation on hand operated Di-Acro Shears. ■ "Precision is one of the chief advantages our Di-Acro Equipment provides," said a Duralith spokesman. "For our plastics applications, Di-Acro Machines are the lowest cost units we could buy to do the job in the manner in which it had to be done." ■ Duralith, of Philadelphia, Pa., uses two 24" and one 12" Di-Acro Shear for cutting plastics and aluminum clad materials. "The fast, multiple setups we can make on this equipment without a lot of additional cost are of advantage to us. And we can cut strips as narrow as we want, even  $\frac{1}{8}$ " strips of Duranyl." ■ For their application, Duralith has equipped a 24" Di-Acro Shear with an air cylinder as shown for added production speed.







No. 1 Di-Acro Shear



No. 3 Di-Acro Shear

## Di-Acro Shear Models

### Models 1, 3, 4

Shearing to die-accurate standards is possible with easy-to-operate Di-Acro Shears. Ideal for experimental and short run production operations. Cutting speeds with these Precision Machines often rivals that of large power models, making them ideal for production operations and all shearable materials. Di-Acro Shears are produced from alloy castings and cold rolled steel bars. Cutting blades are made from alloy steel, properly hardened and precision ground.

### Model 36

A full 36 inch width with minimum operator effort is possible with this Machine because of its powerful eccentric leverage operation. Other valuable features include an inclined ram, roller bearings, bed adjusted lower blade, blade straightener, material hold down bar, machined cast and plate construction.



No. 36 Di-Acro Shear



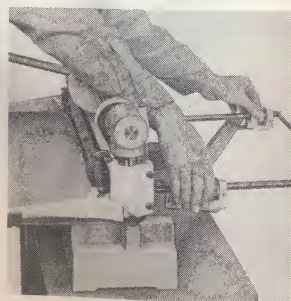
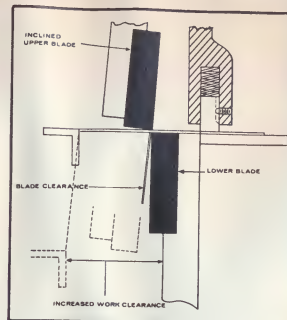
No. 4 Di-Acro Shear



**INCLINED RAM**, on Model 36 only, sets shear blades at an angle to work so that only blade edge is in contact with material — beveled effect tends to reduce shearing force or pressure. Inclined ram approach helps counteract thrust, keeps blade straight.

#### MICROMETER BACK GAUGE

Standard equipment on all hand operated Di-Acro Shears, quick-set micrometer back gauge enables speed and accuracy when changing from one setting to another. Gauge is graduated in .001". One complete turn of the micrometer dial moves the gauge 1/10 of an inch. Gauge can be quickly moved from setting to another by depressing spring loaded micrometer dial and sliding gauge on threaded rod.



#### SPECIFICATIONS — DI-ACRO SHEARS

| Models                                                                                               | No. 1    | No. 3    | No. 4    | No. 36   |
|------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|
| Maximum shearing width                                                                               | 6"       | 12"      | 24"      | 36"      |
| Material capacity, mild steel                                                                        | 16 ga.   | 16 ga.   | 16 ga.   | 16 ga.   |
| Floor space required (on stands)                                                                     | 15"x18½" | 25"x24"  | 20"x38"  | 20"x48"  |
| Weight lbs., Net                                                                                     | 35       | 135      | 260      | 360      |
| Shipping                                                                                             | 40       | 145      | 300      | 400      |
| Export                                                                                               | 50       | 165      | 340      | 420      |
| Price                                                                                                | \$160.00 | \$345.00 | \$465.00 | \$575.00 |
| <b>SHEAR BLADES ONLY</b>                                                                             |          |          |          |          |
| Alloy Tool Steel (per set)                                                                           | \$13.00  | \$25.00  | \$40.00  | \$55.00  |
| Hi-Carbon-Hi-Chrome (per set)                                                                        | 25.00    | 75.00    | 45.00    | 105.00   |
| <b>ADDITIONAL EXTRA</b> when Hi-Carbon-Hi-Chrome blades are installed in place of Alloy Steel blades | 12.00    | 20.00    | 35.00    | 50.00    |
| <b>STAND</b>                                                                                         |          |          |          |          |
| Weight lbs., Net                                                                                     | \$55.00  | \$60.00  | \$65.00  | \$70.00  |
| Shipping                                                                                             | 86       | 96       | 108      | 165      |
| Export                                                                                               | 98       | 100      | 112      | 171      |
|                                                                                                      | 70       | 135      | 148      | 190      |

#### STANDARD EQUIPMENT SHEARS No. 1 - 3 - 4 - 36

Material Hold Down Bar — Models No. 3 - 4 - 36 Only

Side Squaring Gauge

Reversible Protractor Gauge

Set of Four-edged Alloy Tool Steel Blades — Model No. 1 — Two-edged Blades

Micrometer Back Gauge

Long and Short Operating Handles — Model No. 1 - 36 one only

Blade Stop for slitting operations

Di-Acro Shears are also available in Foot Operated and Power Models. For more information write for catalog.